

Claims

1. Hip prosthesis having a shaft (1) which is implantable in the femur,
5 and having a ball head (2) anchored on the shaft (1) by a conical clamp, for example, and having a socket (5) in which the ball head (2) is movably supported, characterized in that a bipolar shell (3) is placed between the ball head (2) and the socket (5), whereby the ball head (2) rotates in the bipolar shell (3) and the bipolar shell (3) rotates
10 in the socket (5).
2. Hip prosthesis according to Claim 1, characterized in that the ratio of the diameters of the slide pairing of the bipolar shell (3) and the ball head (2) is between 1.05 and 5, preferably between 1.2 and 2.
3. Hip prosthesis according to Claim 2, characterized in that the slide
15 pairing diameter of the bipolar shell (3) is between 26 mm and 40 mm, preferably 32 mm, and the slide pairing diameter of the ball head (2) is between 14 mm and 32 mm, preferably 22.2 mm.
4. Hip prosthesis according to one of Claims 1 through 3, having a
20 ceramic ball head (2), a ceramic bipolar shell (3), and a ceramic socket (5), characterized in that the tribological conditions of the ceramic components (2, 3, 5) are defined by a combination of the following features:
 - a) The hardness of the ceramic components (2, 3, 5) is greater than 1,000 HV (Vickers).
 - 25 b) The surface finishes on the articulating surfaces of the ceramic components (2, 3, 5) have a roughness less than 0.1 μm (Ra value $< 0.1 \mu\text{m}$).

- 5 c) The contact angle between the articulating surfaces of the ceramic components (2, 3, 5) is between 1° and 8° (measured in Ringer's solution).
- d) The difference in the slide pairing diameters of the articulating surfaces of the ceramic components (2, 3, 5) is between 1 and 200 µm, preferably between 20 and 120 µm.
- 10 5. Hip prosthesis according to one of Claims 1 through 4, characterized in that the centers of rotation of the ball head (2) with respect to the bipolar shell (3), and of the bipolar shell (3) with respect to the socket (5), have an offset (d) which is between 0.1 mm and 5 mm, preferably between 1.5 and 2.5 mm.
- 15 6. Hip prosthesis according to one of Claims 1 through 5, characterized in that the bipolar shell (3) in cross section has different wall thicknesses, the greatest wall thickness being provided in the region of the opening.